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ABSTRACT

In thinly traded markets for heterogenous, durable goods, such as housing, intermediaries may play especially important roles. Using a unique micro-level dataset of housing transactions in Los Angeles from 1988-2008 and a novel research design, we identify and measure the importance of two very distinct types of intermediaries, also known as "flippers". The first type act as middlemen who quickly match sellers and buyers, operate throughout housing market cycles and earn above average returns when they buy and sell. The second type act as speculators who attempt to time markets by holding assets for longer periods of time, perform relatively poorly when buying and selling and are strongly associated with price instability in their targeted areas. The presence of these unsophisticated speculators and positive feedback trading contribute the first pieces of evidence from the housing market to a growing body of work in other financial markets that questions whether speculators always act to stabilize prices.

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1 Introduction

While housing assets constitute the majority of the wealth held by households in the United States and are subject to considerable volatility, research on the financial microstructure of the housing market has lagged that of the stock market by *decades*. While many influential papers on returns in the stock market were written in the 1960s and 1970s, arguably the first systematic construction of a return series for the housing market dates to the seminal paper by Case and Shiller (1989). In the past several years, the kind of detailed transaction data used by Case and Shiller has become much more widely available, opening up a broad set of empirical finance questions related to housing markets.

Housing provides a prime example of a thin market for high value, durable goods. In such markets, intermediaries often play a number of important economic roles. In housing markets, these intermediaries are often referred to as "flippers", a term used to describe individuals or firms that buy homes with no intention to reside in or rent the property, but simply to quickly resell at a profit. Flippers may serve as *middlemen*, purchasing from sellers with substantial holding costs who cannot afford to wait for the right buyer, thereby providing liquidity in this heterogeneous market. They may also make important *physical investments* in houses, if improvements are optimally made when a house is empty or can be done by them at relatively low cost.[1] And, they may operate as *speculators*, seeking to exploit arbitrage opportunities made possible through either superior information about market fundamentals, or by exploiting deviations from the fundamentals resulting from naïve decision-making on the part of other market actors.

Search frictions and cost asymmetries provide the impetus for flippers' first two roles.[2] As for the last role, modern finance theory describes a richer and more nuanced role for speculators than just serving as the classic arbitrageurs of efficient markets theory, that instantly correct any deviation in pricing from the fundamentals (e.g. Friedman (1953) and Fama (1955)). Some of the sources of rational investors' hesitance to bet against asset mispricing include risk aversion and a lack of close substitute investment opportunities (Wurgler and Zhuravskaya (2002)), noise trader risk (De Long, Shleifer, Summers, and Waldmann (1990a)) and synchronization risk (Abreu and Brunnermeier (2002) and Abreu and Brunnermeier (2003)). A number of these features may be present in the housing market. For example, direct survey evidence showing that home-buyers tend to place excess weight on recent market trends when forming expectations of future price appreciation (Case, Quigley, and Shiller (2003)) suggests a significant presence of noise traders in the housing market.[3] When homeowners chase trends in this way, i.e., engage in positive feedback trading, it can be optimal for rational speculators to jump on the bandwagon with them, buying as prices begin to rise and selling out near the top of the bubble (De Long, Shleifer, Summers, and

[1] In this role, flippers may not only generate returns for themselves (if they can make these improvements at relatively low cost), but may serve to maintain and restore the housing infrastructure of a community, leading to positive externalities in terms of house values and the local tax base for neighboring homeowners.

[2] See Spulber (1996), Rust and Hall (2003), and Hendershott and Zhang (2006), for example.

[3] Evidence that homeowners may be subject to other behavioral biases such as loss aversion is shown in Genesove and Mayer (2001) and Anenberg (2010).

Waldmann (1990b)). In this case, the actions of speculators work to fuel the bubble on the way up and eventually dissolve it and help bring prices quickly back to the fundamentals on the way down.[4]

Despite the potential importance of intermediaries, little is known about their activity or effect on this vital asset market. The goal of this paper is to identify the activity of flippers operating in these three distinct economic roles and to study their impact on the housing market. Our analysis is based on comprehensive micro-level house transaction data from the Los Angeles metro area from 1988-2008 that allows us to identify flippers and study their activity. We introduce a novel research design to decompose observed returns on each flipped home into four components: (i) any discount on the transaction price at the time of purchase, (ii) any premium on the price at the time of sale, (iii) market returns during the holding period, and (iv) any physical improvements made to the property by flippers. This last source of returns presents an econometric challenge for us since improvements are not directly observable in the data. It is here that our research design exploits the panel nature of the data to identify these components of the return. In particular, by examining sales prices in transactions between pairs of non-flippers both prior to and following the period where a flipper buys and sells the property, we are able to control for any persistent changes in the houses unobservable quality that may have been due to flipper investment.

We establish that middlemen and speculators (i) follow very distinct strategies for when and where to buy and (ii) generate returns from almost completely distinct sources.[5] Middlemen hold properties for very short periods of time (a median of six months) and earn most of their return by buying houses relatively cheaply. Flippers in this role tend to be professionals; the same individuals are observed transacting numerous properties throughout the sample period. Market timing is not an important source for their returns; they operate throughout booms and busts in the housing market and target neighborhoods that, if anything, are appreciating more slowly than the rest of the metro area.

By contrast, speculators tend to enter the housing market at an increasing rate as prices rise. They do not buy at much of a discount or sell at a premium, but instead earn almost their entire return through timing the market, i.e., earning the average market return. They operate only during boom times and target neighborhoods with the highest expected price appreciation. Importantly, these targeted neighborhoods experience both an above average rate of appreciation in the short term (next 1-2 years) and a sharp decline in the intermediate term (3-5 years). In this way, entry by speculative flippers is strongly associated with the short-term amplification of neighborhood housing price cycles.

[4]Concerns that flippers may amplify fundamental cycles in local housing markets, thereby contributing to speculative bubbles, have given rise to recent legislation and regulatory changes by the federal government and a number of states and localities seeking to limit flippers' role in the market. For example, in 2006 HUD instituted a new regulation that made houses sold within 90 days of purchase ineligible for FHA financing.

[5]Although not the primary focus of the paper, our research design also enables us to measure the impact that flippers have on the market through investment in physical home improvements. We estimate that flippers of both types (speculators and middlemen) invest little more than the typical homeowner in their homes, implying that their impact on the market comes primarily from their roles in transacting and holding properties.

Interestingly, there are a number of signs that the real-world speculators that we identify in the data may not be as sophisticated as the rational agents of finance theory. First, perhaps fueled by access to equity in their primary residence as prices rise, speculators tend to be amateurs that are not particularly experienced at flipping houses. Secondly, many speculators continue to purchase properties at a rapid rate all the way up to the point that market reaches its peak and hold a large fraction of their purchased properties well past the peak, thereby experiencing substantial losses.[6,7] Here, our paper is related to Brunnermeier and Nagel (2004) who examine the potentially destabilizing force of hedge funds during the technology bubble. While their findings suggest hedge funds may be more sophisticated than our flippers (a fact which should not be terribly surprising), like their paper, ours too calls into question a central tenet of the efficient markets hypothesis: that it is always optimal for rational speculators to attack a bubble.

Taken together, our analysis provides strong evidence that flippers play multiple economic roles in the housing market. As middlemen, flippers may significantly enhance welfare by providing liquidity to high holding cost sellers. As investors in durable good quality, they may promote neighborhood gentrification. Finally, as speculators, they are strongly associated with, and likely contribute to, increased volatility in local housing markets, which has serious economic and social consequences. Given these roles' dueling implications for welfare, and the fact that much of their activity occurs over short holding periods, it may be difficult and suboptimal to target flippers with anti-speculative policy prescriptions such as transaction taxes, which have been suggested in other speculative markets[8], or by limiting their ability to finance investment.[9]

The paper proceeds as follows: Section 2 presents a simple theoretical discussion of the economic roles of flippers as middlemen and speculators. Section 3 describes the unique dataset used and the definition of a flipper. Section 4 outlines the research design that will allow us to identify flipper returns and investment. Section 5 gives our primary empirical results as well as robustness checks for these findings. Section 6 extends our analysis to the neighborhood level and focuses on what types of neighborhoods flippers target and their impact on these neighborhoods. Section 7 investigates whether some flippers were caught holding houses when the housing market turned. Section 8 concludes.

[6]While our research design allows us to decompose the returns for a particular flipped house, it does not allow us to measure the returns to operating in the flipping business *per se*. In particular, because the same individuals that flip certain properties may hold others for a very long time (presumably as rental units), the lack of information on rents in our dataset precludes us from calculating returns for individual flippers. Moreover, our analysis provides only an *ex post* estimate of the particular realization of returns for Los Angeles over the study period, rather than an *ex ante* measure of expected returns. For these reasons, we confine the focus of our paper to a study of the behavior and decomposition of the sources of returns for the distinct types of flippers described above.

[7]Whether the current boom and bust cycle was in fact a bubble in housing is a subject of intense debate. See Himmelberg, Mayer, and Sinai (2005) for a detailed discussion.

[8]See, for example, Tobin (1974), Tobin (1978), Eichengreen, Tobin, and Wyplosz (1995) or Summers and Summers (1988).

[9]A 2006 HUD regulation preventing FHA financing for houses sold within 90 days of purchase likely had this effect. More generally there is reason to believe a wave of "anti-flipper" sentiment may lead to further, similar legislation.

2 Motivating Model

To frame the empirical analysis, it is helpful to present some theoretical foundations for the potential economic roles of flippers as middlemen and speculators. We begin by developing a simple model of the role of flippers as middlemen, using it to explain why middlemen can profitably operate in both hot and cold markets and to characterize how their returns are affected by market conditions. Drawing on the theoretical finance literature, we then describe a theoretical basis for the existence of speculators in the housing market.

2.1 Flippers as Middlemen

We begin by developing a simple theoretical structure that captures the key elements of the home selling problem. There are N potential sellers in each period and seller i has a per-period holding cost $h_i \sim F(h)$, with associated density $f(h)$. In each period, sellers receive an offer with probability λ. Ordinary buyers make a take-it-or-leave-it offer drawn from a normal distribution $N(\mu, \sigma^2)$. A seller can accept the offer or reject it and wait until the next period to potentially sell the house to a new buyer. A maximum of one bidder visits the house in each period.

This structure captures the natural heterogeneity in holding costs and valuations that characterizes the housing market. Holding costs might be high, for example, if a seller needs to relocate to a new city or sell a house quickly to settle a divorce. They could be low if a family wants to trade up to a slightly larger house within the same city or neighborhood but still benefits from the consumption value of their current house. Springer (1996) finds that distressed sellers deal more quickly and sell for less than other sellers. Glower, Haurin, and Hendershott (2003) find that when a seller takes a new job, he sells faster than average, indicating he likely has a higher holding cost. The offer probability λ captures how active or "hot" the market is, with higher values corresponding to more frequent offers.

The solution to the seller's optimization problem can be summarized as the choice of a reservation price, r_i, which is the lowest acceptable offer. At the reservation price, the seller is indifferent between accepting and rejecting the offer. The reservation price takes the following form:

$$r_{it} = E(o_{it}|o_{it} > r_{it}) - h_i E(t_t|r_{it}) \tag{1}$$

where o_{it} is the offer seller i receives at time t and t_t is the time to sale from period t conditional on not selling in period t. Given our assumption, time to sale follows a geometric distribution and in expectation is equal to $(\lambda_t(1 - \Phi(\frac{r_{it}-\mu}{\sigma})))^{-1}$. Equation 1 can therefore be rewritten as:

$$r_{it} = \mu + \frac{\sigma\phi\left(\frac{r_{it}-\mu}{\sigma}\right)}{1 - \Phi(\frac{r_{it}-\mu}{\sigma})} - \frac{h_i/\lambda}{\lambda_t(1 - \Phi(\frac{r_{it}-\mu}{\sigma}))} \tag{2}$$

The comparative statics of equation 2 are well-studied and it is straightforward to show that the reservation price is decreasing in h_i and increasing in λ. That is, reservation prices will be higher when individuals have low holding costs and/or when the market is hot. Given that λ acts

to deflate h_i in equation 2, it is also easy to see that the variance of the distribution of reservation prices among a population of sellers is also decreasing as market conditions improve. Holding the distribution of holding costs fixed, Figure 1 contrasts the distribution of reservation prices in hot versus cold markets.

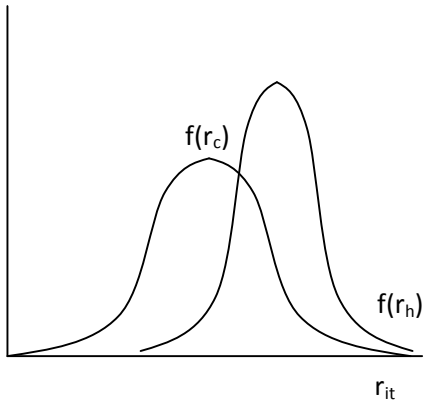

Figure 1: Distribution of reservation prices in "hot" (h) and "cold" (c) markets.

We introduce flippers into the model in a simple, straightforward way. We assume that the number of flippers is small and does not affect expectations about offer arrivals.[10] Flippers have per-period holding costs h_f, which account for the fact that the house is left empty while on the market and reflect flippers' ability to secure mortgage financing.[11]

When flippers buy a house, they immediately put it back on the market with the hope of reselling it. In this way, flippers determine their maximum offer based on a problem identical to that faced by sellers more generally.[12] Let r_f be the reservation price associated with holding costs h_f. Figure 2 shows the distribution of seller reservation prices and the threshold r_f that triggers a sale to a flipper. By making a take-it-or-leave-it offer, the buyer extracts the entire surplus generated by a trade with high holding cost seller, which is equal to the difference in reservation prices.[13]

We now consider flipper activity in hot versus cold markets (i.e., high versus low values of λ). We establish two straightforward results. First, whether flippers can profitably operate in the market is simply a function of the relationship between their holding cost and those of sellers in the market. If the distribution of holding costs is not related to market conditions (as we have assumed here), the threshold of seller holding cost that will induce a trade with a flipper is unchanged. *Thus, flippers can profitably buy and sell properties from high holding cost sellers regardless of market*

[10] It would be straightforward, but would add little insight, to extend the model to allow sellers to account for the potential arrival of offers from flippers.

[11] Flippers will generally have higher holding costs than many owner-occupants who continue to receive consumption value from residing in the house but potentially significantly lower holding costs than sellers who need to vacate their property quickly or that need to sell their old house in order to secure mortgage financing for a new one.

[12] Thus, flippers will find it profitable to buy a property whenever their holding cost is lower than that of the seller or equivalently when their reservation price is higher.

[13] A more general assumption about the bargaining process, e.g., that the buyer and seller split the surplus through Nash bargaining, could easily be incorporated and would not change the key conclusions below.

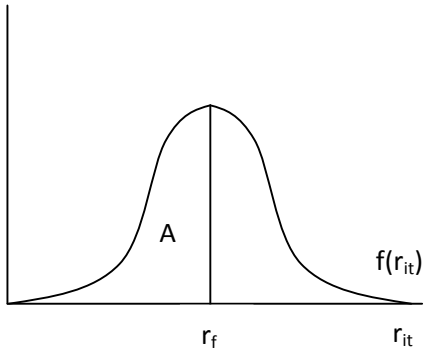

Figure 2: Distribution of seller reservation prices and the threshold r_f triggering a sale to a flipper.

conditions.

The second result that we establish is driven by the impact of market conditions on the distribution of reservation prices. In particular, because reservation prices are more compressed in hot markets, the surplus generated by a transaction between a high holding cost seller and a flipper will shrink, resulting in flippers paying higher prices relative to their own reservation values. *As a result, the "discount at purchase" that flippers receive at the time of purchase is smaller in hot versus cold markets.*[14]

2.2 Flippers as Speculators

The theoretical finance literature supports (at least) two broad rationales for the existence of speculators in the housing market. Most obviously, efficient market theory admits an economic role for speculators that have access to better information than the broad set of agents participating in a market. Given the decentralized nature of the housing market, with many individuals participating in the home buying or selling process only a handful of times during their lives, it is easy to imagine that some market professionals might be especially well-informed or be able to process information in a sophisticated way that generates arbitrage opportunities. Under efficient markets theory, acting on the basis of their superior information about the fundamentals, speculators have an unambiguously positive impact on the market, serving to align prices more closely with the fundamentals.

Behavioral finance theory admits a wider range of strategies for speculators and a much more ambiguous understanding of their impact on welfare and efficiency.[15] The starting point for much of modern behavioral finance theory is the presence of a set of naïve market actors, noise traders, who are subject to expectations and sentiments that are not fully justified by information about market fundamentals. By following simple strategies, such as chasing trends, or by sticking to rules of thumb, noise traders can create distortions between prices and market fundamentals.

[14]Note that this does not imply that middlemen get lower average rates of return in hot versus cold markets, as their time to sale will also be significantly shorter in hot market conditions.

[15]See Shleifer and Summers (1990), Barberis and Thaler (2003) and Shiller (2003) for excellent summaries of standard behavioral finance theory.

In this setting, potential arbitrageurs face multiple risks. Even if they are fully aware that prices have temporarily deviated from the fundamentals, there is a risk that they might deviate further in the short-run (depending on the beliefs and activity of the noise traders) before eventually falling back in line with the fundamentals. It is not always optimal, therefore, for arbitrageurs to simply "go short" on any observed market deviations from the fundamentals.

In fact, it can be optimal to pursue a much wider range of strategies. If, for example, noise traders engage in positive feedback trading - i.e., have a tendency to extrapolate or to chase the trend, it can be optimal for rational speculators to jump on the bandwagon (De Long, Shleifer, Summers, and Waldmann (1990b)). By buying as noise traders begin to get interested in a market, speculators actually fuel the positive feedback trading that motivates the noise traders. And, by selling out as the market nears a peak, speculators speed the return of the market to the fundamentals. In this case, rational speculators take advantage of the noise traders by strategically selling out before the noise traders realize the bubble is about to burst. From this last example, it is easy to see that the welfare consequences of the existence of speculators need not be positive. To the extent that their actions fuel bubbles and increase volatility in the market, speculators tend to decrease welfare and market efficiency.

3 Data

The primary dataset for our analysis is based on a large database of housing transactions from Dataquick, a for profit company that collects publicly available information on houses and sells this information to interested businesses such as banks and lenders. For each transaction, the data contain the names of the buyer and seller, the transaction price, the address and property identification number, the transaction date, and numerous house characteristics including, for example, square footage, year built, number of bathrooms and bedrooms, lot size and whether the house has a pool.

While these data are the most comprehensive available, there are some drawbacks to the way Dataquick creates its database. Dataquick collects information from two sources. Its transaction variables, which include the date, price, and names of the buyer and seller are based on publicly available data and thus cover every transaction in the United States. Its housing attribute variables are drawn from a second public source, the local tax assessor's office. The drawback is that Dataquick only maintains one assessor file, overwriting historical information, so that all observations for a given house are essentially assigned the same house attributes. This prohibits researchers from tracking major home improvements by using changes in house characteristics over time. Given that these are the best data available, this drawback motivates our research design below in order to track house improvements.

We focus on the five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura), between 1988 and 2008. From the initial set of transactions we clean the data for several reasons. We drop observations if we suspect that a property was split into several smaller

properties and resold, the price of the house was less than \$1,[16] the house sold more than once in a single day, the price or square footage was in the top or bottom one percent of the sample, there is an inconsistency in the data such as the transaction year being earlier than the year the house was built, or the sum of mortgages is \$5,000 more than the house price. Table 1 provides summary statistics of the cleaned data.

	Mean	Std. Dev
Price	265,396	188,522
Square Footage	1,598	607
Transaction Year	1997.8	5.72
Lotsize (sq. ft.)	10,871	601,047
Year Built	1969.8	20.8
Bathrooms	2.13	0.74
Bedrooms	3.01	0.91
Has Pool?	0.13	0.34
Has Loan?	0.89	0.31
Loan to Value	0.76	0.30
Number of Transactions	2.35	1.23

Table 1: The table shows transaction-level summary statistics for data that cover five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura). Based on 3,544,615 transactions from 1988-2008. Loan to value and is measured relative to the price paid.

Anticipating our discussion of flipper behavior in "hot" and "cold" markets below, we summarize the number of transactions over time in LA. We differentiate between hot and cold markets based on transaction activity. As shown in Figure 3, LA was hot at the beginning of the sample period and then cooled for most of the 1990s. In the late 1990s, it picked back up with sales peaking in the 2002-2003 period before dropping significantly towards the end of the sample when the latest housing boom collapsed.

3.1 Flippers

We identify flippers and flipped houses using two pieces of information in our dataset: the period of time that a house was held and the names of buyers and sellers. We define a flipped house to be one that satisfies three criteria: (1) the house must be bought and sold under the same name in less than two years;[17] (2) the flipper must be an individual; and (3) the flipper must complete a minimum number of flips that satisfy (1).

The first criterion is motivated by our need to be able to measure returns. Not only do we need to see the flipper buy and sell the house during the sample period but, because we do not observe rental income, we focus on properties that are re-sold relatively quickly as these are likely to be held empty during the holding period. Criterion (2) limits the sample to individuals instead

[16] A price of zero suggests that the seller did not put the house on the open market and instead transferred ownership to a family member or friend. We are not interested in these transactions.

[17] In our robustness checks, we vary this length of time.

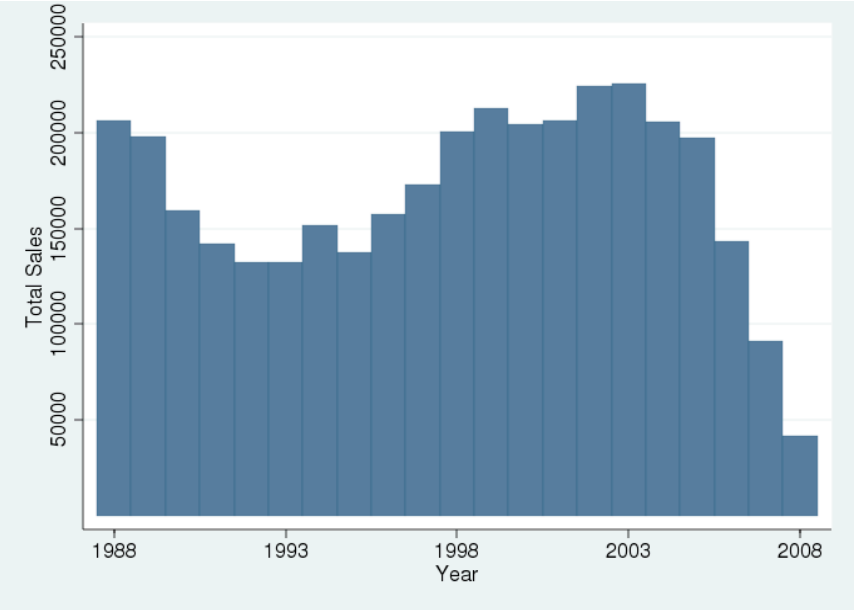

Figure 3: Yearly sales data cover five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura), from 1988-2008.

of businesses or financial institutions. The logic is that many of these larger buyers may purchase houses when the owner forecloses on his mortgage and, therefore, these are not actively chosen flips in the sense that we are considering. Criterion (3) aims to eliminate situations where an individual quickly buys and sells a home one time, perhaps driven by personal employment or family shocks. By requiring individuals to engage in this behavior a minimum number of times, it is more likely that pure investment motives drive these purchase decisions. In addition, we exclude cases where the flipper bought a house from a major bank or government agency that we suspect may have sold a foreclosed home.

While their activity certainly increased in the latest housing boom, flippers have been active in the Los Angeles housing market throughout the entire sample period as shown in Figure 4. This figure shows the percent of total purchases by flippers by year against the LA MSA price index (we explain below how this index is calculated). We divide flippers into four types based on experience: flipper 1's: 2-3 flips, flipper 2's: 4-6 flips, flipper 3's: 7-10 flips, flipper 4's: 11 or more flips. The striking feature of Figure 4 is that while experienced flippers are present throughout the sample, inexperienced flippers participate at much higher rates as prices begin to rise.

4 Research Design

We are interested in uncovering flippers' returns. A complicating factor is that we are unable to detect improvements they make before reselling. To address this problem we have developed a novel method for uncovering returns in the (potential) presence of unobserved investment. The

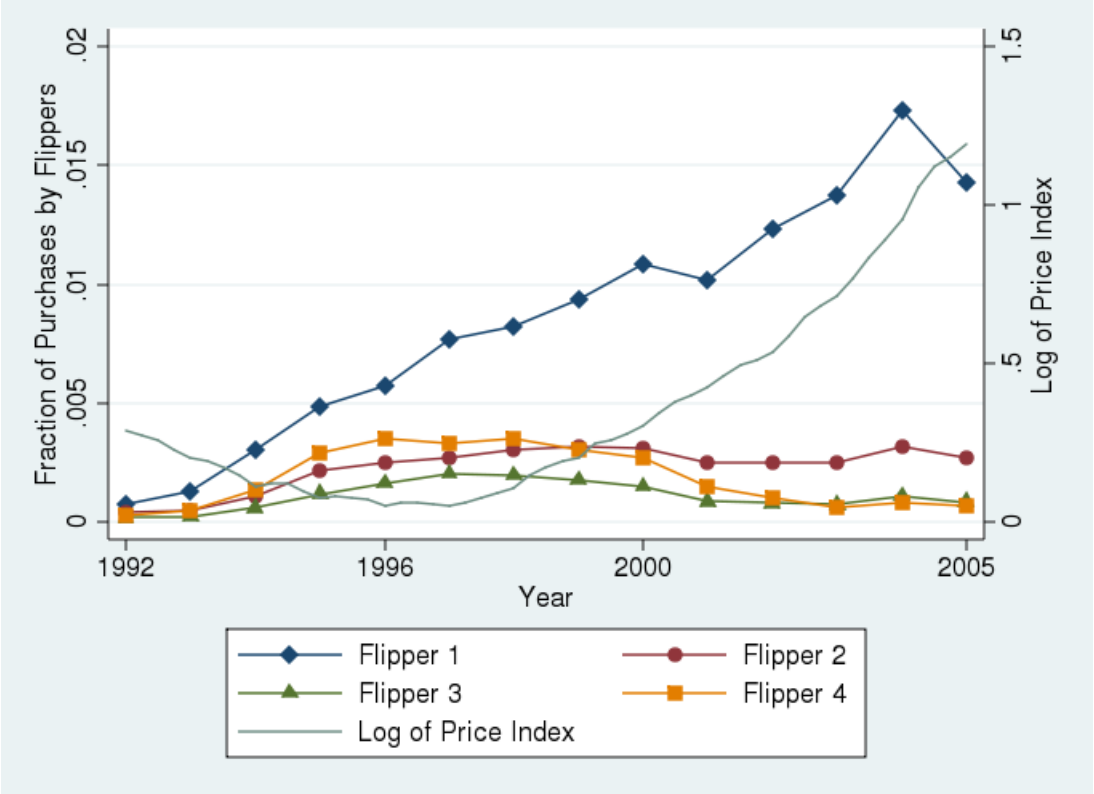

Figure 4: The figure plots the percent of flipper purchases by year by type. Flipper 1's: 2-3 flips, flipper 2's: 4-6 flips, flipper 3's: 7-10 flips, flipper 4's: 11 or more flips. The data cover five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura).

method is based on a repeat sales index which we first review.

Case and Shiller (1987) introduced the repeat sales regression to generate a price index:

$$log(p_{it}) = \alpha_1 yq_t + \alpha_2 id_i + \varepsilon_{it} \tag{3}$$

In equation 3, yq_t represents a quarter fixed effect and id_i is a house-level fixed effect on house i. Exponentiating the coefficients on the time fixed effects gives the price index for each quarter, which can be normalized to 1 in any quarter. This framework requires that quality is constant for each house across sales. Additionally, it assumes that the market evolves homogeneously across different regions of a metropolitan area.

We modify this framework by first introducing controls for whether the buyer or seller is a flipper. If the coefficient on the *Flipper Buyer* dummy is negative, it suggests that flippers buy houses below their expected value. A positive sign on the *Flipper Seller* coefficient would indicate that flippers sell houses for more than their expected value.

$$log(p_{it}) = \alpha_1 yq_t + \alpha_2 id_i + \beta_{1k} b_{kit} + \beta_{2k} s_{kit} + \varepsilon_{it} \tag{4}$$

In equation (4), b_{kit} is a dummy for if the buyer is a flipper of type k and s_{kit} is a dummy equaling

one if a flipper of type k is the seller. This estimated coefficients related to flipper activity will provide unbiased estimates of the discount that flippers get when buying and the premium they command when selling, provided that house quality is constant over time. If, however, flippers purchase houses and then invest heavily to improve them before putting them back on the market, these parameter estimates will be biased. In particular, we would expect β_{1k} to be negative because the true house quality in this period would be less than the estimated quality. Similarly, β_{2k} would likely be positive because the true quality in this period would be greater than the quality estimated. The researcher may, therefore, infer that flippers are buying at a discount and selling at a premium when they are simply investing more than the average homeowner.

Because of this concern, we adapt this framework to control for the possibility of unobserved investment in the property by the flipper. To do so, we add an additional term to the regression:

$$log(p_{it}) = \alpha_1 yq_t + \alpha_2 id_i + \beta_{1k} b_{kit} + \beta_{2k} s_{kit} + \beta_{3k} a_{kit} + \varepsilon_{it}. \tag{5}$$

Here we introduce a_{kit}, which is equal to one if, in any previous period, we see a flipper of type k purchase house i. This variable, therefore, controls for any improvements made by the flipper that extend beyond average homeowner investment since β_{3k} captures the change in house quality between when the flipper purchased and sold the home.

A repeat sales regression typically requires a house to sell at least twice to be included. To identify unobserved investment, however, we require that the house sells at least four times. Specifically, we require observing one non-flipper to non-flipper transaction before and after a flipper buys and sells the house. Figure 5 provides a visual illustration of how this structure controls for unobserved investment. In particular, consider a house that sells at four transaction times: A, B, C and D. At A both transacting parties are non-flippers. At B the house is sold to a flipper by the non-flipper. At C the flipper sells the house to a non-flipper. At D it is sold to a non-flipper by the non-flipper. The observation before the flipper buys can be used to identify the original house quality and the observation after the flipper sells is used to identify the new house quality.

The left figure shows a flipper who buys below market price in period B and is able to sell above market price in C without making any improvements. In the right figure, the flipper makes improvements as can be seen by the fact that p_D is above its expected price, conditional on p_A. If we do not account for this improvement, it will appear that the flipper sold the house for above market value when in fact he sold it for exactly market value.

We include other variables on the right side of equation (5) to control for additional house characteristics. To control for the possibility that flippers buy specific types of homes whose value grows faster than the average house, we interact the flipper dummies with observable house characteristics.

To address the legitimate concern that restricting the sample to houses that sell at least four times will result in a highly non-representative sample, table 2 compares the sample of homes that sell four times to the full sample. While the restricted sample tends to contain newer, smaller, and cheaper houses than the overall sample, these differences are relatively minor, giving us confidence

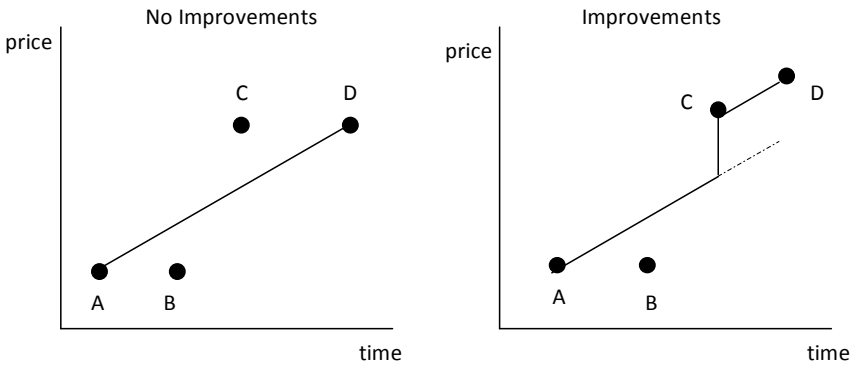

Figure 5: Left: A case where the flipper did not make improvements between periods B and C. Right: An instance where the flipper did make improvements between B and C.

that our analysis generalizes to all housing transactions in LA.

	All Observations	≥4 Sales
Year Built	1969.8	1972.6
	(20.8)	(19.6)
Year Bought	1997.8	1999.7
	(5.72)	(5.28)
Square Feet	1,598	1,480
	(607)	(555)
Number of Bedrooms	3.01	2.79
	(0.91)	(0.89)
Number of Bathrooms	2.13	2.12
	(0.74)	(0.71)
N	3,544,615	247,341

Table 2: The table shows transaction-level summary statistics by number of sales for data that cover five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura). Standard deviations in parentheses. Based on 3,544,615 transactions from 1988-2008.

Finally, there is some chance that we still misestimate housing improvements within this framework. If a flipper improves the home, sells it to someone under whom the investment depreciates to the point where the investment has no impact on price when this new owner sells, we may mistakenly believe that the flipper made no investment. We can check for this bias by varying the time between sales since we will be more likely to detect flipper investment the shorter is the time that the person who purchased the home from the flipper holds it before reselling. We perform this robustness check in Section 5.3.

5 Two Types of Flippers

In this section we analyze returns over time and across flipper types to illustrate the (i) presence of and (ii) differences between middlemen and speculative intermediaries.

5.1 Flippers' returns

We now explore flippers' returns and their sources using the research design above. The results appear in Table 3. To be included in the time period, the house must sell at least four times in the sample. Additionally, the second of these four sales must occur within the time period mentioned. We exclude the end of the sample from these regressions because we need to follow the property for at least two years from the purchase date to estimate its return. By limiting the sample from 1992 to 2005, we also can easily split it into cold (1992-1998) and hot (1999-2005) periods of equal length.

	(1)	(2)	(3)	(4)	(5)	(6)
Flipper Buyer	-0.047	-0.046	-0.133	-0.120	-0.033	-0.034
	(0.005)	(0.005)	(0.015)	(0.015)	(0.005)	(0.005)
Flipper Seller	0.030	0.027	0.077	0.043	0.015	0.016
	(0.004)	(0.004)	(0.012)	(0.011)	(0.004)	(0.004)
Flipper Investment	0.005	-0.011	-0.025	-0.036	0.010*	-0.001
	(0.005)	(0.005)	(0.015)	(0.014)	(0.006)	(0.005)
Interact House Characteristics?	No	Yes	No	Yes	No	Yes
Time Period	1992-2005	1992-2005	1992-1998	1992-1998	1999-2005	1999-2005
N	247,341	247,341	110,979	110,979	146,951	146,951

Table 3: The log of price is the dependent variable. All regressions include house and quarter fixed effects and control for how many times the house has previously been transacted in the sample. Standard errors in parentheses. Interacting house characteristics indicates that the mean house characteristics for the sample are subtracted from individual house characteristics and these values are interacted with the flipper dummies. The sample is restricted to houses that sell at least four times with the second sale occurring within the time period specified.

Controlling for unobserved investment, we find that flippers enjoy a buyer's discount of about 4.7% when purchasing a house over the full sample period. That is, they purchase the house for approximately 5% less than its expected market price. Flippers also earn a premium of 3.0% when they sell the property (after controlling for investment). When we control for house characteristics by interacting the mean-differenced value of house characteristics with the flipper dummies, the magnitude of these coefficients hardly changes. In specifications (1) and (2), the coefficient on *Flipper Investment* shows that on average flippers are not investing more than typical homeowners.

Specifications (3) and (4) restrict the sample period to the cold period (1992-1998), which was characterized by fewer sales and flat housing prices. Specifications (5) and (6) restrict the sample to the hot period (1999-2005) as prices were growing and sales increased. As predicted by the

theoretical framework developed in Section 2, flippers purchase at a much steeper discount in the cold versus hot period (12-13% versus 3.3-3.4% in the hot period).

We now investigate the differential sources of returns across flipper experience levels, using the same four categories defined above in Figure 4. To begin, Table 4 shows the differences in the types of houses each investor flips. In general, the types of homes purchased are similar across flipper type except that more experienced flipper types tend to buy older homes.

Flipper Type	1	2	3	4	All Houses
Year Built	1968.7	1963.2	1956.9	1953.7	1972.6
	(22.0)	(23.0)	(23.1)	(23.3)	(19.6)
Year Bought	2001.2	2000.7	2000.2	1999.3	1999.7
	(2.70)	(3.12)	(3.19)	(3.05)	(5.28)
Square Feet	1,467	1,380	1,295	1,275	1,480
	(572)	(513)	(471)	(436)	(555)
Number of Bedrooms	2.81	2.79	2.73	2.82	2.79
	(1.00)	(0.88)	(0.88)	(0.83)	(0.89)
Number of Bathrooms	2.05	1.96	1.79	1.70	2.12
	(0.75)	(0.73)	(0.72)	(0.68)	(0.71)
N	3,843	764	298	275	247,341

Table 4: The table shows house-level summary statistics by type of flipper for data that cover five counties in the LA area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura). Standard deviations in parentheses.

While it is clear that flippers outperform other market participants when both buying and selling (Table 3), there is distinct heterogeneity in this performance based on flipper experience type as Table 5 illustrates. Looking across flipper types, it is clear that while all flippers buy relatively cheaply, more experienced flippers buy much more cheaply. There is also evidence that flipper 4's sell for relatively higher prices than do other flippers. Finally, even when controlling for flipper type, we still find that flippers invest very little in their houses prior to resale.

Using our repeat sales framework, we can also assess the composition of a flipper's return: breaking this into a the fraction that stems from buying cheaply, selling high, and simply earning the market return during the holding period. These results are in Table 6. We include estimates of flipper rates of return based on time held, market growth, and the residuals. These returns do not account for flippers' transaction or holding costs, meaning actual returns are likely to be somewhat smaller. Nonetheless, the estimated average rates of returns earned by all types of flippers during our sample period suggest that they, in fact, can operate quite profitably in the market.

Table 6 highlights the distinction between flipper types and provides strong evidence that some flippers act as speculators while others operate as middlemen. First, there is a large disparity in time held. Flipper 4's quickly resell their houses while flipper 1's hold them almost twice as long. Second, flipper 1's are not able to buy cheaply or sell for high prices and thus their (nominal) rate of return is primarily driven by overall market growth: 76% of their return stems from market growth. Flipper 4's, on the other hand, earn most of their return by purchasing well (purchasing

	(1)	(2)	(3)	(4)	(5)	(6)
Flipper 1 Buyer	-0.022	-0.024	-0.083	-0.084	-0.015	-0.017
	(0.005)	(0.005)	(0.018)	(0.018)	(0.006)	(0.006)
Flipper 2 Buyer	-0.075	-0.076	-0.189	-0.171	-0.051	-0.061
	(0.015)	(0.013)	(0.039)	(0.036)	(0.015)	(0.014)
Flipper 3 Buyer	-0.148	-0.119	-0.228	-0.205	-0.124	-0.095
	(0.026)	(0.026)	(0.054)	(0.046)	(0.029)	(0.031)
Flipper 4 Buyer	-0.215	-0.193	-0.258	-0.295	-0.186	-0.153
	(0.027)	(0.037)	(0.047)	(0.087)	(0.033)	(0.038)
Flipper 1 Seller	0.025	0.025	0.050	0.037	0.016	0.016
	(0.004)	(0.004)	(0.012)	(0.011)	(0.004)	(0.004)
Flipper 2 Seller	0.022	0.012	0.053	0.030	0.012	0.009
	(0.012)	(0.012)	(0.033)	(0.034)	(0.013)	(0.011)
Flipper 3 Seller	0.047	0.012	0.161	0.032	-0.008	0.000
	(0.021)	(0.027)	(0.054)	(0.063)	(0.020)	(0.023)
Flipper 4 Seller	0.089	0.044	0.198	0.096	0.027	0.022
	(0.021)	(0.023)	(0.040)	(0.062)	(0.023)	(0.020)
Flipper 1 Investment	0.003	-0.010	-0.006	-0.027	0.004	-0.002
	(0.006)	(0.005)	(0.017)	(0.015)	(0.006)	(0.006)
Flipper 2 Investment	0.018	0.004	-0.043	-0.040	0.025	0.005
	(0.015)	(0.015)	(0.040)	(0.046)	(0.015)	(0.014)
Flipper 3 Investment	0.017	0.002	-0.084	-0.053	0.055	0.031
	(0.023)	(0.023)	(0.051)	(0.049)	(0.025)	(0.026)
Flipper 4 Investment	0.007	-0.009	-0.055	-0.095	0.039	0.018
	(0.028)	(0.035)	(0.053)	(0.084)	(0.030)	(0.034)
Interact House Characteristics?	No	Yes	No	Yes	No	Yes
Time Period	1992-2005	1992-2005	1992-1998	1992-1998	1999-2005	1999-2005
N	247,341	247,341	110,979	110,979	146,951	146,951
R^2	0.933	0.934	0.924	0.924	0.942	0.942

Table 5: The log of price is the dependent variable. All regressions include house and quarter fixed effects and control for how many times the house has previously been transacted in the sample. Standard errors in parentheses. Interacting house characteristics indicates that the mean house characteristics for the sample are subtracted from individual house characteristics and these values are interacted with the flipper dummies. The sample is restricted to houses that sell at least four times with the second sale occurring within the time period specified.

	Nominal Rate of Return	Buyer Discount	Seller Premium	Market Growth	Quarters Held	N
Flipper 1	0.207	-0.024	0.025	0.159	4.036	3,843
Flipper 2	0.252	-0.076	0.012	0.122	3.336	764
Flipper 3	0.315	-0.119	0.012	0.093	2.846	298
Flipper 4	0.530	-0.193	0.044	0.063	2.262	275

Table 6: The table shows the sources of returns by flipper type over time. The discounts, premiums, and market growth are calculated from specification (2) of Table 5 and quarters held is simply the mean number of quarters held. The nominal rate of return is generated by dividing the mean total return (premium - discount + market growth) by the mean years held.

cheaply generates 64% of their return) and quickly reselling so that only 21% of their return stems from overall market growth. Taken together, these pieces of evidence clearly support the distinction between middlemen and speculators in the market. Inexperienced flippers are speculators aiming to buy homes and hold on to them during times of overall market appreciation. Alternatively, middlemen aim to find homes they can buy at relatively large discounts and quickly resell to high value buyers. As shown in Figure 4, middlemen operate fairly steadily throughout housing cycles, while speculators enter the market at an increasing rate as it booms.

For exposition sake, for the rest of the paper we group flippers into two categories based on experience. Experienced flippers, or middlemen, are those who engage in 4 or more flips over our sample (in the language above, these are flippers 2-4's) and inexperienced flippers, or speculators, are those who flip two to three times during our sample (flipper 1's). While these definitions are somewhat arbitrary, and there is certainly not a perfect relationship between experience and whether flippers operate as middlemen or speculators, this appears to divide flippers into two categories of intermediaries that are following very distinct strategies for earning returns in the market. The results presented below are robust to altering the thresholds of this dichotomy.

5.2 Explaining Middlemen's Returns Over Time: Spread of Prices

The evidence presented above implies that experienced flippers, who act as middlemen, earn quite large returns. This is sensible since (as shown in Table 5) these middlemen earn their greatest returns in cold markets when sellers' reservations prices, reflecting their holding costs, are more dispersed. Figure 6 shows the standard deviation of prices, as measured by the standard deviation of residuals from the basic repeat sales regression, for each year. The simple theoretical model presented in Section 2 provides a direct explanation for why reservations prices (and, consequently, sales prices) are more dispersed in cold versus hot periods. To further investigate the impact of price dispersion on flipper returns, we introduce a new variable - the standard deviation of residuals in the transaction quarter - to the regression framework above. This variable, generated by taking the standard deviation of residuals in the original repeat sales regression, measures the spread of prices around their expected values. We are interested in whether flippers buy at larger discounts when prices are more dispersed, that is if the coefficient on the variable interacting the spread of

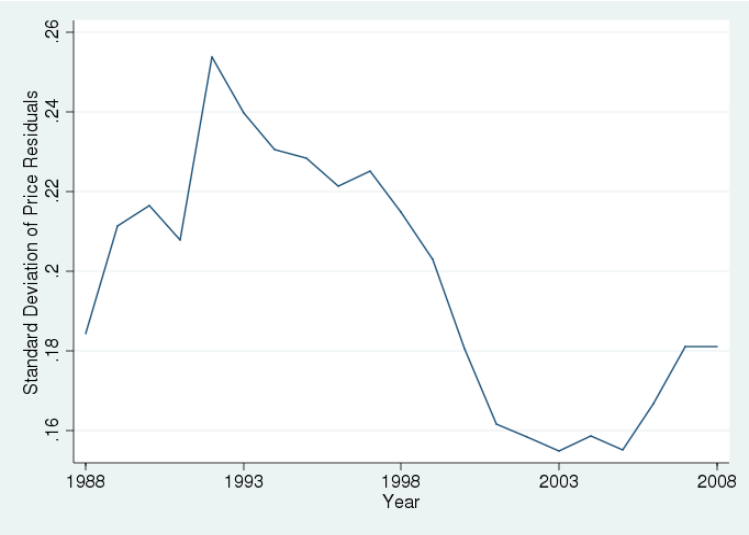

Figure 6: Standard deviation of price residuals from repeat sales regression over time.

prices with a dummy for a flipper buying is negative. Similarly, if flippers earn larger premiums selling in periods with a greater spread of prices, the coefficient on this interaction term will be positive.

Specifications (1) and (2) of Table 7 include the entire period and in each, flippers receive larger discounts as buyers when prices are more dispersed. We find similar results on the sales side of the transaction as well – with flippers earning higher sales premiums when prices are more dispersed. Moreover, middlemen do increasingly better than speculators as price dispersion rises, as evidenced in specifications (3) and (4).

5.3 Robustness

Throughout the paper, we require that a flipper must hold a flipped house for less than two years. We now consider the effect of adjusting this time period to determine if our results are sensitive to the length of time used to define a flip. In Table 8, the first specification is the baseline, which uses the estimates from specification (2) in Table 3. Specifications (2) and (3) in Table 8 vary the amount of time required from eighteen months to three years, respectively. The other requirements to be classified as a flipper remain constant meaning specification (2) is more restrictive than our baseline and specification (3) is less restrictive. Specifications (4) and (5) limit the time between A and B, and C and D, respectively. Specification (6) combines these restrictions.

The results show that decreasing the flip time to eighteen months increases both the estimated discount flippers receive when buying and their premium when selling. When loosening the restriction so flippers can hold for up to three years, their estimated returns are smaller but still statistically significant. These results indicate that even when we use a looser definition of a flip, we still find that flippers are able to pay less than the average homeowner when buying and sell for more.

	(1)	(2)	(3)	(4)
Flipper Buyer	-0.063	-0.062		
	(0.006)	(0.006)		
Flipper Seller	0.059	0.054		
	(0.008)	(0.008)		
Flipper Investment	-0.006	-0.023		
	(0.008)	(0.008)		
SD Resid*Flipper Buyer	-1.595	-1.546		
	(0.176)	(0.173)		
SD Resid*Flipper Seller	1.793	1.534		
	(0.326)	(0.324)		
SD Resid*Flipper Investment	-0.570	-0.582		
	(0.275)	(0.275)		
Inexperienced Flipper Buyer			-0.034	-0.037
			(0.007)	(0.006)
Experienced Flipper Buyer			-0.126	-0.116
			(0.012)	(0.012)
Inexperienced Flipper Seller			0.055	0.052
			(0.008)	(0.008)
Experienced Flipper Seller			0.061	0.039
			(0.016)	(0.016)
Inexperienced Flipper Investment			-0.010	-0.022
			(0.008)	(0.008)
Experienced Flipper Investment			0.006	-0.008
			(0.016)	(0.017)
SD Resid * Inexperienced Flipper Buyer			-1.049	-1.064
			(0.194)	(0.193)
SD Resid * Experienced Flipper Buyer			-2.145	-2.069
			(0.344)	(0.342)
SD Resid * Inexperienced Flipper Seller			1.655	1.435
			(0.337)	(0.335)
SD Resid * Experienced Flipper Seller			1.847	1.531
			(0.669)	(0.661)
SD Resid * Inexperienced Flipper Investment			-0.642	-0.587
			(0.282)	(0.282)
SD Resid * Experienced Flipper Investment			-0.506	-0.536
			(0.574)	(0.571)
Interact House Characteristics?	No	Yes	No	Yes
Time Period	1992-2005	1992-2005	1992-2005	1992-2005
N	247,341	247,341	247,341	247,341
R^2	0.933	0.934	0.933	0.934

Table 7: The log of price is the dependent variable. All regressions include house and quarter fixed effects and control for how many times the house has previously been transacted in the sample. Standard errors in parentheses. Interacting house characteristics indicates that the mean house characteristics for the sample are subtracted from individual house characteristics and these values are interacted with the flipper dummies. *SD Resid* is the standard deviation of residuals for a given quarter where the residuals were generated using the repeat sales regression used to estimate the price index. The sample is restricted to houses that sell at least four times with the second sale occurring within the time period specified.

	(1)	(2)	(3)	(4)	(5)	(6)
Flipper Buyer	-0.046	-0.065	-0.030	-0.057	-0.030	-0.048
	(0.005)	(0.006)	(0.004)	(0.008)	(0.006)	(0.009)
Flipper Seller	0.027	0.033	0.021	0.044	0.023	0.043
	(0.004)	(0.004)	(0.003)	(0.006)	(0.004)	(0.007)
Flipper Investment	-0.011	-0.013	-0.007	-0.033	-0.008	-0.034
	(0.005)	(0.006)	(0.004)	(0.009)	(0.006)	(0.010)
Robustness Check	Baseline	Flip in < 1.5 Years	Flip in < 3 Years	A to B < 3 Years	C to D < 3 Years	Specifications (4) and (5)
N	247,341	247,341	247,341	90,150	173,456	64,883

Table 8: Standard errors in parentheses. The sample is restricted to houses that sell at least four times with the second sale occurring within the time period specified. Additionally, the buyer on the second sale must be the seller in the third sale and the seller in the second sale cannot be a large organization or company suspected of selling foreclosed homes. Specification (1) is set to specification (2) from Table 3. Specification (2) is similar to the baseline but changes the maximum holding time from 2 years to 18 months. Specification (3) changes a flip to 3 years. Specification (4) requires that the time between transactions A and B is less than 3 years. Specification (5) requires that the time between transactions C and D is less than 3 years. Specification (6) requires the conditions in both (4) and (5).

By limiting the times between A and B and C and D, specifications (4)-(6) address the potential problem that flippers may either (i) buy homes which have been recently run down or (ii) invest in houses, only to have their investment depreciate by period D. For example, requiring the time between C and D to be short limits the possibility that a flipper's investment can depreciate. The consistency in these specifications' results largely alleviates these concerns.

6 Neighborhood Level Results

In this section we provide corroborating evidence from the neighborhood-level that flippers operate as both speculators and middlemen. In addition, we present suggestive evidence that speculative flippers are associated with greater price instability at the neighborhood level.[18]

6.1 Which Neighborhoods are Targeted?

To categorize the data by neighborhood, we merge the Dataquick data with Census data that assigns each house a neighborhood based on its California state assembly lower voting district.[19] We use voting districts because they are both large enough to get a reasonable number of flipper observations in each district, and small enough to characterize a neighborhood or group of neighborhoods. Given our results which suggest low investment by flippers, as well as the current focus, for this portion of our analysis we include all flipped homes, no longer requiring that the they sell

[18]This finding echoes that of Greenwood and Nagel (2009) who present evidence that inexperienced, speculative mutual fund managers are associated with price instability in that market.

[19]We drop those districts without many observations leaving forty districts in the data.

at least four times. Of course, the definition of a house flip and the repeat sales analysis still require that these properties are transacted at least twice.

We relate flipper activity to neighborhood price appreciation, calculated using a repeat sales index for each neighborhood. In all cases, appreciation is measured over a year. Table 9 associates flipping purchases with neighborhood-level price appreciation.[20] The regressions include neighborhood level and quarter fixed effects. The specifications differ in the lag between flipping activity and price changes. The first two columns show that the greater holdings by inexperienced, speculative flippers are associated with above average rates of price appreciation over the following two years, while the last three columns show that these short term gains are followed by below average returns (mean reversion) over the following three years.

Experienced flippers (largely middlemen), on the other hand, operate in areas where prices are not rising as quickly as the rest of the metropolitan area. As discussed in Section 2, since middlemen earn their returns by finding "good" deals when purchasing and selling for high prices relative to the market rate, it is not surprising to find them operating in hot and cold neighborhoods just as they operate in hot and cold portions of the housing cycle.

	(1)	(2)	(3)	(4)	(5)
Flipper Houses Bought:					
Inexperienced	1.031	0.768	0.171	-0.512	-0.320
	(0.228)	(0.241)	(0.201)	(0.252)	(0.306)
Experienced	-0.864	-0.760	-0.556	-0.235	0.544
	(0.205)	(0.283)	(0.220)	(0.232)	(0.403)
Lag Time (quarters)	4	4	4	4	4
Dependent Variable	(t+1)-t	(t+2)-(t+1)	(t+3)-(t+2)	(t+4)-(t+3)	(t+5)-(t+4)
N	2680	2520	2360	2200	2040
R^2	0.918	0.916	0.912	0.911	0.909

Table 9: The unit of observation is the quarter-neighborhood. The dependent variable is one year price appreciation between the time period specified in the Dependent Variable row. The independent variables include the fraction of houses purchased by inexperienced and experienced flippers in that neighborhood at period t. Standard errors in parentheses are clustered by neighborhood. All specifications include neighborhood and quarter fixed effects.

Given the strong association between speculative activity and the amplification of local housing booms and busts, it is useful to examine whether speculators are responding to recent neighborhood level price changes or might base their decisions on additional information. To explore this possibility, we begin by reconfirming, at the neighborhood level, the previous finding in the literature that lagged appreciation strongly predicts future price appreciation. We follow the technique suggested in Case and Shiller (1989) for dealing with measurement error in the price index by (i) splitting our

[20] We obtain similar results if lagged flipper holdings are used instead. We present evidence of this below where holdings are constructed as follows:

$$h_{itn} = h_{it-1n} + b_{itn} - s_{itn} \tag{6}$$

where h_{itn} are the holdings of all flippers of type i in quarter t in neighborhood n, b_{tin} are the purchases by flippers in neighborhood n in the quarter, and s_{tin} are the sales by flippers in same neighborhood and quarter.

sample in two, (ii) generating estimates of appreciation independently for each sample, and (iii) instrumenting for lagged appreciation in one sample with the estimate of lagged appreciation from the other sample.

	(1)	(2)	(3)	(4)	(5)
Lagged Appreciation	0.453	0.104	-0.080	-0.198	-0.222
	(0.061)	(0.062)	(0.076)	(0.072)	(0.100)
Lag Time (quarters)	4	4	4	4	4
Dependent Variable	(t+1)-t	(t+2)-(t+1)	(t+3)-(t+2)	(t+4)-(t+3)	(t+5)-(t+4)
N	2680	2520	2360	2200	2040
R^2	0.873	0.886	0.883	0.882	0.880

Table 10: The unit of observation is the quarter-neighborhood. The dependent variable is one year price appreciation between the time period specified in the Dependent Variable row. Appreciation in the neighborhood between periods $t-1$ and t is the independent variable. Standard errors in parentheses are clustered by neighborhood. All specifications include neighborhood and quarter fixed effects. All coefficients and standard errors are averages across 25 randomizations where we split the sample into two and instrument for appreciation in sample A with its value in sample B.

The results presented in Table 10, which control for quarter dummies and neighborhood fixed effects, establish positive short-term persistence and long-term mean reversion in house price appreciation at the neighborhood level. In this way, a sharp uptick in lagged appreciation is a clear predictor of above-average short-term returns at the neighborhood level. To our knowledge, the fact that, even at the neighborhood-level, lagged appreciation strongly predicts future price appreciation is undocumented elsewhere in the literature.

Table 11, includes controls for both lagged appreciation and speculative activity. The results reveal that both factors continue to be strongly associated with increased price volatility at the neighborhood level. The positive correlation between these two measures, and the resulting diminished magnitudes of the coefficients on flipper activity in Table 11 versus Table 9 imply that speculators are engaging to some extent in positive feedback trading.

There are at least three explanations for a remaining positive relationship between speculative activity and neighborhood appreciation (positive in the short-run, negative in the intermediate run) after controlling for lagged appreciation. First, the relationship between flipper activity and lagged appreciation may be non-linear, with flipper activity triggered only after expected appreciation reaches a minimum threshold. Second, flippers might be responding to other information (unobserved in our dataset) that predicts above-average returns over short horizons and mean reversion in the slightly longer run. Third, flipper activity might have a causal effect on neighborhood appreciation rates, contributing to the amplification of the local housing price boom-bust cycle over the next several years. While distinguishing among these explanations is beyond the scope of this paper, our neighborhood level analysis allows us to conclude that speculators in this market engage in positive feedback trading and that their activity is strongly associated with the amplification of house price volatility at the neighborhood level.

	(1)	(2)	(3)	(4)	(5)
Lagged Appreciation	0.441	0.050	-0.130	-0.243	-0.203
	(0.065)	(0.059)	(0.079)	(0.080)	(0.112)
Flipper Houses Bought:					
Inexperienced	0.911	0.782	0.270	-0.385	-0.406
	(0.239)	(0.247)	(0.268)	(0.339)	(0.314)
Experienced	-0.240	-0.732	-0.705	-0.524	0.286
	(0.220)	(0.288)	(0.254)	(0.248)	(0.433)
Lag Time (quarters)	4	4	4	4	4
Dependent Variable	(t+1)-t	(t+2)-(t+1)	(t+3)-(t+2)	(t+4)-(t+3)	(t+5)-(t+4)
N	2680	2520	2360	2200	2040
R^2	0.875	0.888	0.884	0.882	0.880

Table 11: The unit of observation is the quarter-neighborhood. The dependent variable is one year price appreciation between the time period specified in the Dependent Variable row. The independent variables include the fraction of houses purchased by inexperienced and experienced flippers in that neighborhood at period t and appreciation in the neighborhood between periods $t-1$ and t. Standard errors in parentheses are clustered by neighborhood. All specifications include neighborhood and quarter fixed effects. All coefficients and standard errors are averages across 25 randomizations where we split the sample into two and instrument for appreciation in sample A with its value in sample B.

7 How Well-Informed Are Speculators?

Our evidence so far establishes a set of market intermediaries that act as speculators who are (i) inexperienced, (ii) enter the market as prices begin to rise, (iii) specifically target neighborhoods with the greatest expected future price appreciation and (iv) earn their returns only by holding houses when prices rise since they are unable to (a) buy at great discounts or (b) sell their assets at a premium. This behavior can be explained by some of the recent advances in the modern finance theory which call into question the central tenet of the efficient markets hypothesis (e.g. Friedman (1953) and Fama (1955)) that rational investors should always "attack a bubble." These more recent papers suggest instead that rational speculators may instead want to jump on the bandwagon with the noise traders, ride the bubble on the way up and sell out as the market nears or reaches its peak (DeLong, Shleifer, Summers, and Waldmann (1990b)).

In Section 6, we established that speculators in this market are engaging, to some extent, in positive feedback trading: entering neighborhoods with above-average appreciation the previous period and potentially fueling a short-term speculative local bubble. What remained difficult to ascertain in that analysis was whether speculators actually have superior information, and are therefore timing both their purchases and sales optimally, or whether these inexperienced speculators are simply chasing trends themselves without any special access to superior information.

While some might take the inexperience of the speculators in the data as *prima facie* evidence that they are not especially well informed, we offer a more formal analysis of their behavior in this

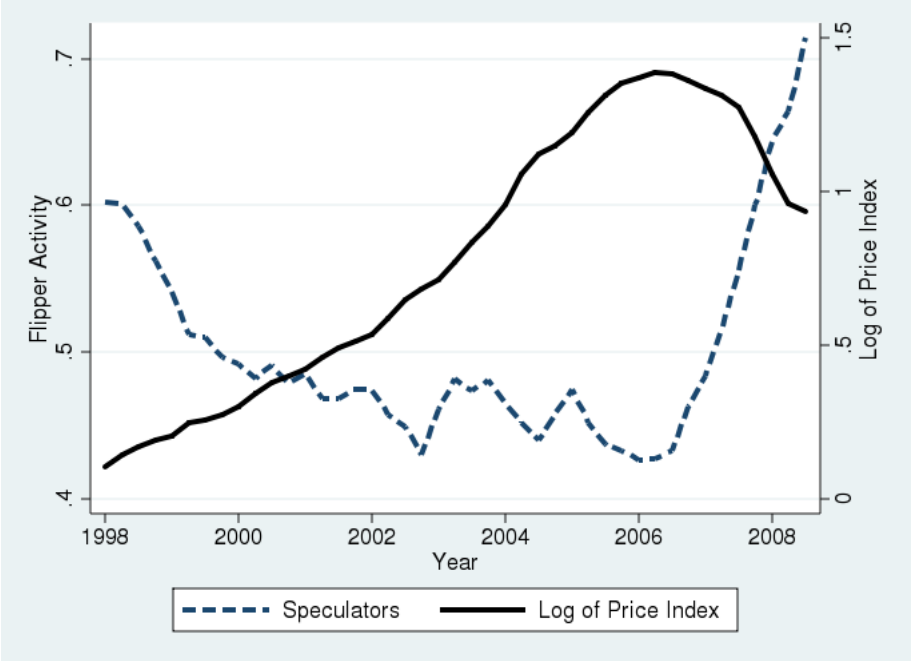

Figure 7: The dashed line maps the fraction of houses purchased two years earlier that are still held by speculators for each quarter. The solid line gives the price index as estimated in the data.

section.[21] In particular, we present evidence on the timing of purchases and sales by the speculators in our sample as the Los Angeles market neared, hit, and then went over its peak in 2006. For this analysis, we construct a sample of all homes purchased by individuals identified as flippers in our sample, regardless of whether they sold the homes within two years. We continue to divide flippers into speculators and middlemen based on experience, focusing here on the activities of speculators near the peak of the Los Angeles market.

Figure 7 plots the fraction of speculators' purchases from two years prior to time t that they continue to hold at time t. For homes purchased in the early and middle periods of the housing boom between 1999-2006, speculators generally unloaded about 55% of their holdings within two years, holding only 45% of their properties for more than two years. Looking two years after the market began to peak in 2005-2006, however, reveals that by late 2007, speculators were stuck holding a much higher fraction of the homes that they purchased as the market peaked. In fact, speculators were stuck holding over 60-70% of the homes purchased near the end of the boom period two years later. Given the rapid rates of price depreciation over this period, it is obvious that such speculators took substantial losses on these properties.[22]

[21] Other researchers (e.g. Greenwood and Nagel (2009)) have found that inexperienced traders engage in the type of trend chasing behavior exhibited here. There is also a multitude of evidence of this phenomenon from lab and retail investor survey settings. See, for example, Smith, Suchanek, and Williams (1988), Haruvy, Lahav, and Noussair (2007) or Vissing-Jorgensen (2003).

[22] Our findings that inexperienced speculators in this market hold properties too long as the market peaked in 2006 is really the mirror image of the findings reported in Brunnermeier and Nagel (2004), which demonstrated that more experienced traders, hedge fund managers, divested their holdings of assets with inflated prices just prior to prices falling in tech bubble.

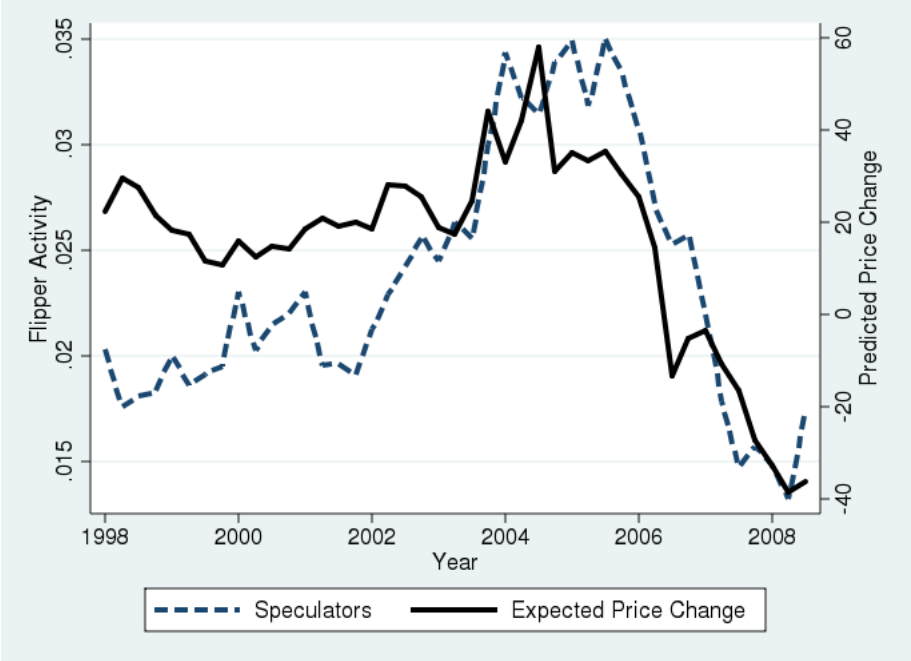

Figure 8: The dashed line maps the percent of purchases made by speculators in each quarter. The solid line gives the expected house appreciation over the next two years based on regressions using appreciation estimates from the Federal Housing Finance Agency's price index for the Los Angeles-Long Beach-Glendale MSA.

Of course, if speculators had curtailed their activity in anticipation of the coming peak, getting stuck holding a relatively high fraction of their peak purchases two years later would not necessarily be that devastating – i.e., if the number of homes affected was small. As it turns out, as shown in Figure 8, speculators continued to purchase at a high rate all the way up to the peak in the market. During the housing boom, speculator activity had slowly increased from about 1.5% of all purchases in the late 1990s to consistently above 3% of purchases between 2004 and 2006. While speculator activity began to fall in 2006 it was not until the middle of 2007 that activity returned to the 1.5% level.

To illustrate the clear sense that the fevered speculative activity went on far too long, Figure 8, also plots a measure of predicted 2-year appreciation rates based on a model of predicted appreciation similar to those reported in Table 10, but estimated at the metropolitan level using FHFA price indices for over 400 metropolitan areas from 1975 to 2010. While predicted 2-year appreciation began to drop off quickly in early 2005, speculative purchases at rates above 3% continued until early 2006.

Looking at speculative behavior in the third quarter of 2006 provides a clear indication of this point. By the third quarter of 2006, the predicted rate of return over the next two years (based on lagged appreciation) had fallen from a high of 58% to negative 13%. Yet speculators continued to account for 2.5% of the purchases in the market that quarter. Over the next two years, speculators were only able to unload 29% of these purchases and thus took substantial losses on properties that

well-informed agents would never have purchased in the first place.

Taken together, the evidence presented here regarding the timing of speculative activity near, at, and following the peak, strongly suggests that a large share of the speculators operating in the Los Angeles market were not especially well-informed and, in fact, were likely simply chasing trends themselves, much like ordinary homeowners.

8 Conclusion

Making use of a large transactions database and a novel research design, this paper provides the first comprehensive study of intermediaries (middlemen and speculators) in the housing market: identifying (i) their activity, (ii) the sources of their returns, and (iii) the extent to which their activity is associated with local price dynamics. Our analysis for Los Angeles establishes that middlemen and speculators follow distinct strategies for when and where to buy and generate returns from almost completely distinct sources. Middlemen hold properties for very short periods of time and earn most of their return by buying houses relatively cheaply; they operate throughout booms and busts in the market and target all types of neighborhoods. By contrast, speculators earn almost their entire return through timing the market, operate only during boom times, and target neighborhoods with the highest expected price appreciation. Entry by speculative flippers is strongly associated with the short-term amplification of neighborhood housing price bubbles. And, given their inexperience flipping homes and apparent difficulty anticipating and reacting to the peak of the most recent housing boom, it seems likely that many of the speculators identified in the data are noise traders themselves rather than the rational arbitrageurs of modern finance theory.

This paper makes several important contributions to the literatures on housing and financial markets. Most directly, it expands our understanding of the microstructure of the housing market: establishing a number of new empirical facts about the activity of middlemen and speculators in the market that generally conform to the roles prescribed in economic theory. More generally, our ability to identify speculators in the data and analyze their strategies and impact on the market is relatively rare in the wider empirical finance literature. While not completely conclusive, our findings that speculators engage in positive feedback trading and may not be especially well informed about market fundamentals are strongly suggestive that speculators in this market have substantial destabilizing effects on prices, leading to an amplification of local housing price cycles. While this increased volatility has important economic consequences, any policy remedies need also account for the welfare-enhancing role that flippers play by providing liquidity as middlemen and in improving the physical stock of housing in older neighborhoods.

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